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Title

Sustainable Wine Production in the Austrian UNESCO World Heritage Wachau

I want to submit an abstract for:

Conference Presentation

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Keywords

Sustainability, Certification System, Wachau, Steep Slopes, Winegrowers' Cooperative, Quality Management,

Research Question

What are the requirements to implement a sustainability certification system in a winegrowers' cooperative dealing with steep slopes in the UNESCO World Heritage Wachau?

Methods

A survey was performed to collect relevant qualitative and quantitative data by questionnaires and structured interviews. Furthermore, several round table meetings with all stakeholders took place to generate additional information.

Results

The certification process raises awareness for sustainability among cooperative stakeholders (e.g. members). Questionnaires as data collecting instrument for further measures. Creation of a benchmark model relating to other wine cooperatives.

Abstract

Sustainable Wine Production in the Austrian UNESCO World Heritage Wachau
Ehardt, S., Forneck, A. and Rosner F.G.

Introduction

For many centuries, wine production has been developed and established in certain regions, which produce physiologically ripe grapes. The fact that grapevines are cultivated in permanent culture means that unqualified

activities in the vineyard lead to long-term problems, e.g. soil compaction, water pollution or destruction of fauna and flora. This environmental degradation can endanger the continued existence of viticulture. In 1987, the “Report of the World Commission on Environment and Development: Our Common Future” (Brundtland-Report) defined sustainability for the first time as “... development that meets the needs of the present without compromising the ability of future generations to meet their own needs” (G.H. Brundtland, 1987).

The Austrian Program for the Agricultural Environment (ÖPUL) created awareness of the necessity for more environmental friendly methods in the vineyards. The result is an organic production on 5,663 ha or 13.6 percent of the total cultivated vineyard surface, thereby taking first place in Europe. Moreover, some private initiatives adopted stricter regulation than the law requires. As supermarkets started to establish sustainable certification systems for fruits and vegetables, the Austrian Association of Wine growers initiated a national system for the wine sector in 2011.

The Austrian sustainability measurement tool takes the regional differences and different management systems in the Austrian wine sector into account and also consider the quality of environmental sustainability, which is not only merely be measured in terms of carbon consumption, but also by other sustainability criteria such as energy consumption, climate change, material consumption, soil, biodiversity and water. The entire production chain, from the vineyard to the labelled and packaged bottles (cradle to factory gate), as well as social and economic criteria is incorporated. Each assessment is scientifically defined within a scale ranging from -10 to +10 with zero meaning insignificant or having a neutral effect. A user-friendly online tool provides an overview of how sustainable each activity is. This can lead to positive steering effects within the wineries. A spider diagram shows the effects on each sustainability criteria using a traffic light system with green for positive and red for negative expression. This proves that sustainably and unsustainably producing wineries can be defined by this system (Rosner, F.G. et al., 2015).

The winegrowers' cooperative “Domäne Wachau” (DW) with 326 members cultivate 457.92 hectares of vineyards, which corresponds to 34 % of the total vineyard area of the UNESCO World Heritage Wachau (1344 ha). The aim of a master thesis was to examine whether and which measures in the vineyard lead to a sustainable wine production in the Austrian UNESCO World Heritage Wachau using the Austrian sustainability certification online tool (ASCOT).

Material and Methods

A survey was performed to collect relevant qualitative and quantitative data by questionnaires and structured interviews. The survey was pre-trialed to increase ease of completion and ambiguity of the questions. For the data collection of the 326 members a data entry form was created in order to prevent that existing data of DW lead to a duplication but also with the possibility to generate new data. A key importance of the data entry form was a high user-friendliness because of sometimes difficult demographic structure of the members and other reasons. For further collecting information for the ASCOT but also to considering new and regional sustainable typicity and authenticity of the heritage Wachau, several round-table meetings took place with the members of the board DW, experts of the ASCOT, heads of the water cooperatives in the villages Arnsdorf and Wösendorf.

Results

Identification and evaluation of the influencing factors concerning a successful ASCOT certification process. Raising awareness among the cooperative stakeholders (e.g. members) for a sustainable grape production. Another achievement is that the created questionnaires will be used in future to enhance the certification process and launch further measures. The adjustment of the ASCOT system to the needs of a winegrowers' cooperative in order to create a benchmark model for other wine cooperatives. In addition, other relevant results were found within the evaluation of the data raised.

Landscape elements: The members of the DW cultivate 97.3 ha in the slope category 4, which is a share of 21.2 % compared to the total area. Preventing erosion dry stone walls, which are landscape elements promoting biodiversity has to be mentioned in the region Wachau. In the case of the members of the DW, 311,694 square meters are maintained this means incredible 680 m² per hectare or for 14.7 m² vineyard one m² dry stone wall is used.

Regional greening concept: Approximately 20 years ago, a regional greening concept was developed (mixture of Serradella (*Ornithopus sativus*), Weißklee (*Trifolium repens*), Gelbklee (*Medicago lupulina*), Inkarnatklee (*Trifolium incarnatum*), Phazelia (*Hydrophyllloideae*), Öirettich (*Raphanus sativus* var. *oleiformis*), Buchweizen (*Fagopyrum*)) to maintain and promote soil fertility (nitrogen-binding plants) and biodiversity but also to prevent atypical and invasive plants. More than 30 % of the vineyards use this row intercropping mixture.

Water management: The region Wachau realized terraces to use efficiently the rain but due to rocky and stony

subsoils as well as climate change with dry rain periods irrigation is necessary to ensure the quality. On this occasion, drip irrigation is used. Based on the records of two water cooperatives, an average water consumption of 95 liters per vine (3,500 vines per hectare) and year (2018) were irrigated.

Quality improvement measures: DW has already introduced a quality assurance measurement system combined with a monitoring form called "Boniturbogen", which includes for example leaf wall height >100cm, leaf wall management, insecticide prohibition using pheromone traps, adequate greening (Wachauer greening mixture), exclusively manual pruning and harvesting. DW recommends its members using typical regional varieties such as "Riesling" and "Grüner Veltliner" for new planting or vineyard conversion, but these requirements are not mandatory.

Energy: Due to the dominance of slopes power hoes are used. In average 134 liters diesel and bio diesel per hectare and year are necessary to cultivate the vineyards. This amount is on a very low level and takes into account that the number of treatments are below-average.

Literature

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For the examination of the different slope categories (Figure 2), the regional vineyard register at the district administration using GIS mapping was contacted.

Category No.	Slope gradient	Further comments
1	0 – 16 %	Easy vineyard management, no dry stone walls necessary, 480 h/ha manpower
2	16 – 26 %	590 h/ha manpower because of efforts for vineyard management and maintenance for the dry stone walls
3	26 – 40 %	675 h/ha manpower because of high efforts for vineyard management with difficult machine cultivation and maintenance for the dry stone walls
4	>40 %	785 h/ha manpower because of high efforts for vineyard management with exclusively manual work and maintenance for the dry stone walls

Fig. 2: slope categories (Kaiserschatt, T., 2016)